

The Northeast Regional Report

THE COMMERCIAL HARVESTING SECTOR

Introduction

The Northeast Region's commercial oceanic and estuarine fisheries produced domestic landings worth \$869 million at dockside in 1993. Figure 7-1 shows a 10-year trend of landings and ex-vessel revenue of finfish and shellfish landed or raised in the Northeast Region. In 1993, finfish landings accounted for 35 % of the revenue generated in the region. The real prices, weight, and real ex-vessel value of the ten most valuable species of fish and shellfish landed or raised in the Northeast Region in 1993 are shown in Table 7-1 for the period 1984-93¹. Of the top ten, seven are invertebrates and five are harvested predominantly inshore (O-3 miles). Over the 10-year period, many changes have occurred in the landings,

value, and ranking of the most valuable species. For instance, both sea urchins and Atlantic salmon have experienced very dramatic increases, both from essentially zero value to the eleventh and sixth most valuable species, respectively. Landings of sea urchins have increased from 45 metric tons (t) in 1984 to 19,200 t in 1993, with a real value of \$2 1.9 million. The rapid development of this fishery continues almost unchecked except for the adoption by the state of Maine of a closed season during summer months when sea urchin roe is much less appetizing to the Japanese consumer. The presence of farmed fresh Atlantic salmon as the current sixth highest valued species in the Northeast illustrates the growing importance of marine aquaculture to the Northeast economy.

Lobsters and scallops have continually been the two most valuable species in the Northeast Region. Scallop value dropped drastically in 1993 by 36%, while landings declined by 48 %. In an effort to save the resource, the meat-count standard of regulation was replaced in 1994 with limits on the

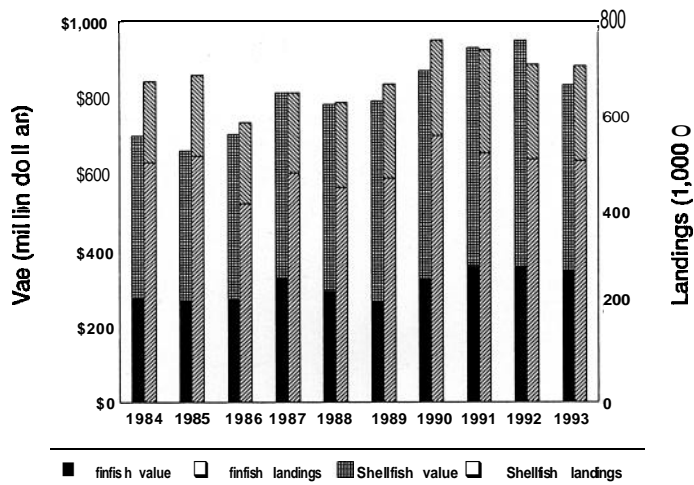


Figure 7-1

Northeast landings and real ex-vessel value of finfish and shellfish.

¹Landings of finfish lobster, shrimp, and crab are given in live weight; landings of all other shellfish are expressed in meat weight. Value and price are expressed in real dollars.



Farmed Atlantic salmon from Maine (NMFS photo by William B. Folsom).

number of days vessels can spend at sea, a moratorium on new entrants, and permitting requirements.

Another notable trend in the Northeast is the continued decline in landings of the region's "traditional" groundfish species (cod, haddock, and yellowtail flounder), which fell from 72,100 t in 1984 to 27,400 t in 1993. The real value of these traditional groundfish landings has also decreased since 1984 by almost 50%, from \$91 million to \$46.8 million. In 1993, these species accounted for 7% of total catch by value (4% by weight). Haddock and yellowtail, not included in Table 7-1 since they are no longer in the top ten listing of highest valued species, ranked thirty-third and twentieth in terms of value in 1993, respectively, down from twelfth and eighth in 1984. Figure 7-2 shows landings and prices for the traditional groundfish mix.

An indication of the relative importance of gear types, by revenue earned, is shown for 1993 landings in Table 7-2. Otter trawls produced the greatest percentage of total revenue, followed by combined inshore and offshore lobster gear and sea scallop dredges. These three gear types accounted for over half of the region's ex-vessel revenue, a percentage that has been shrinking as effort has shifted to the harvest of nontraditional species with other gear types. Menhaden purse seines and bottom otter trawls account for over half of the landings by weight. Many vessels and boats employ more than one gear type. The ability to change from one fishing method to another is of particular importance in fisheries where different species are harvested, requiring different techniques at various seasons of the year.

Vessels equipped with otter trawls land different species depending on the area in which they fish. Figures 7-3 and 7-4 compare the species composition by value for New England and Mid-Atlantic otter trawls for 1993.

Figure 7-5 shows the total number of identifiable vessels (those vessels of known tonnage, excluding undertonage vessels) using scallop dredge, otter trawl, and other gear from 1984 through 1993. In 1993, the total number of vessels in the Northeast Region was at one of its highest levels. Combined with the constant or declining trend in landings, this provides some evidence of overcapitalization in Northeast fisheries. There has been an increase in the number of vessels using otter trawl gear and a decrease in the number of scallop dredge vessels.

Table 7-1

Volume (1,000 t), real ex-vessel value (million dollars), and real price per pound of the ten most valuable species landed or raised in the Northeast Region in 1993.

Species	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Lobster										
Volume	20.6	21.3	20.8	20.8	22.2	24.0	27.6	29.1	26.0	28.0
Real value	\$134.4	\$123.9	\$123.9	\$142.1	\$140.9	\$137.3	\$133.0	\$141.0	\$137.7	\$157.3
Real price	\$2.96	\$2.64	\$2.70	\$3.10	\$2.87	\$2.60	\$2.19	\$2.20	\$2.40	\$2.54
Sea scallops										
Volume	7.7	6.8	8.3	13.2	13.0	14.4	17.2	17.2	14.2	7.5
Real value	\$103.5	\$76.3	\$93.9	\$123.4	\$117.3	\$116.7	\$129.9	\$130.3	\$127.1	\$78.7
Real price	\$6.10	\$5.09	\$5.13	\$4.23	\$4.08	\$3.67	\$3.42	\$3.44	\$4.05	\$4.85
Blue crab										
Volume	45.8	48.0	42.9	38.9	41.8	45.6	43.9	49.5	30.1	57.1
Real value	\$36.4	\$38.1	\$35.4	\$37.6	\$39.1	\$38.7	\$38.1	\$34.3	\$28.7	\$56.0
Real price	\$0.36	\$0.36	\$0.38	\$0.44	\$0.42	\$0.38	\$0.39	\$0.31	\$0.43	\$0.44
Cod										
Volume	43.9	37.4	27.6	26.8	34.6	35.6	43.6	42.2	27.9	22.9
Real value	\$39.7	\$37.1	\$37.2	\$44.2	\$41.4	\$44.0	\$54.1	\$63.1	\$43.2	\$36.2
Real price	\$0.41	\$0.45	\$0.61	\$0.75	\$0.54	\$0.56	\$0.56	\$0.68	\$0.70	\$0.72
Hard clam										
Volume	5.0	5.7	4.7	5.0	6.8	4.2	4.6	4.4	4.3	4.3
Real value	\$41.3	\$48.5	\$41.9	\$50.3	\$46.9	\$46.6	\$41.4	\$38.0	\$33.7	\$35.1
Real price	\$3.75	\$3.86	\$4.08	\$4.59	\$3.13	\$5.05	\$4.08	\$3.91	\$3.56	\$3.68
Atlantic salmon										
Volume	—	—	—	—	—	—	2.1	4.7	5.8	6.7
Real value	—	—	—	—	—	—	\$14.2	\$25.5	\$37.5	\$34.3
Real price	—	—	—	—	—	—	\$3.08	\$2.46	\$2.91	\$2.30
Menhaden										
Volume	261.1	314.6	222.6	300.0	273.5	287.8	336.1	294.8	285.9	317.0
Real value	\$30.4	\$32.9	\$25.1	\$32.5	\$28.6	\$28.8	\$32.8	\$28.2	\$26.1	\$33.7
Real price	\$0.05	\$0.05	\$0.05	\$0.05	\$0.05	\$0.05	\$0.04	\$0.04	\$0.04	\$0.05
Surf clam										
Volume	32.9	32.1	35.4	27.4	28.6	30.4	32.6	30.0	33.2	33.5
Real value	\$38.5	\$40.0	\$43.5	\$27.9	\$27.9	\$28.3	\$28.5	\$24.8	\$28.7	\$30.8
Real price	\$0.53	\$0.57	\$0.56	\$0.46	\$0.44	\$0.42	\$0.40	\$0.37	\$0.39	\$0.42
Oyster meats										
Volume	7.2	6.7	6.8	4.3	3.1	2.4	3.3	4.0	4.6	2.9
Real value	\$44.0	\$31.8	\$39.0	\$29.5	\$25.2	\$20.5	\$35.3	\$34.6	\$46.4	\$29.6
Real price	\$2.77	\$2.15	\$2.59	\$3.11	\$4.66	\$3.83	\$4.88	\$3.97	\$4.50	\$4.68
Squid loligo										
Volume	10.5	9.0	11.5	10.5	18.9	23.0	15.0	19.4	18.2	22.3
Real value	\$6.8	\$6.6	\$9.3	\$9.3	\$14.9	\$20.1	\$12.4	\$19.3	\$19.3	\$23.9
Real price	\$0.29	\$0.33	\$0.36	\$0.40	\$0.36	\$0.40	\$0.37	\$0.45	\$0.48	\$0.49

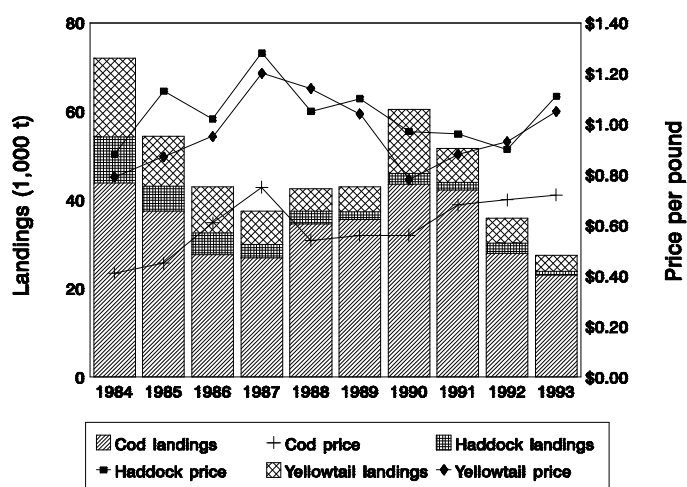


Figure 7-2

Northeast landings and real price of cod, haddock, and yellowtail flounder.

Table 7-3 shows the number of vessels and boats granted permits by fishery category and gear type for 1993. Frequently, vessel owners apply for a permit in several different fisheries and for several gear types. Hence, the total number of permits issued is far greater than the total number of unique vessels or boats. The greatest number of permits issued was for rod-and-reel use in several fisheries by both vessels and boats.

These permits are used principally for catching bluefin tuna.

Employment levels in the harvest sector in the Northeast are difficult to estimate. Data from 1987 and 1992 censuses estimated that over 72,000 persons have at least part-time dependence as harvesters on the commercial fisheries of the region. Half of these were fully dependent on fishing, employed as vessel and boat owners or crew.

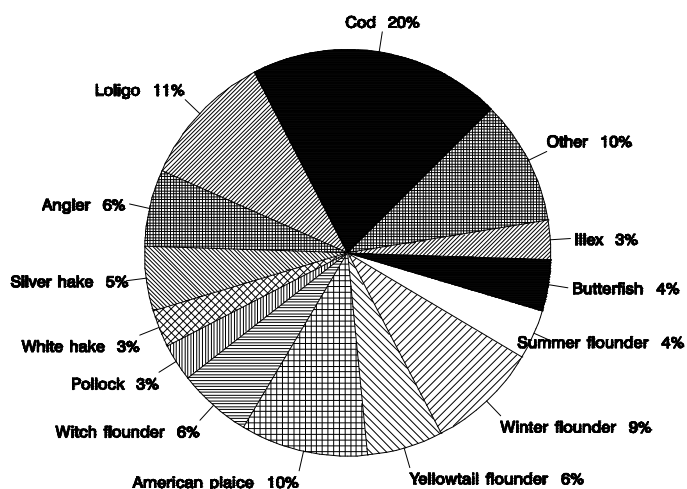


Figure 7-3
New England bottom otter trawl, 1993 species composition by value.

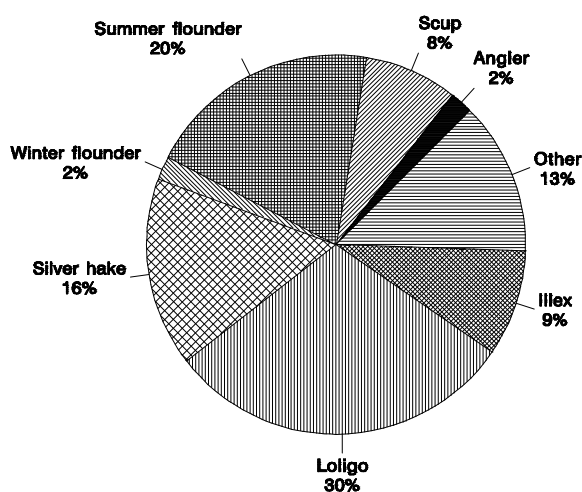


Figure 7-4
Mid Atlantic bottom otter trawl, 1993 species composition by value.

Table 7-2
Landings and ex-vessel revenue in the Northeast Region in 1993, by gear type.

Gear type	Landings (1,000 t)	Revenue (\$millions)
Otter trawl, bottomfish	129.73	187.0
Pots and traps, lobster	28.02	157.3
Dredges		
Sea scallop	11.36	102.6
Surf clam, ocean quahog	55.97	53.7
Purse seines, menhaden	310.86	40.9
Pots and traps, blue crab	25.92	32.4
Longlines, bottom and pelagic	7.66	29.7
Sink gill nets	22.69	24.8
Diving gear	16.65	24.3
Rakes	1.76	17.8
Hoes	1.47	12.8
Handlines, other	0.91	12.7
Tongs and grabs	0.62	7.1
Dredges, clam	0.58	6.0
Purse seines, herring	38.43	5.1
Otter trawl		
Bottom-shrimp	2.20	5.0
Bottom-scallops	0.47	4.4
Dredges, oyster	0.23	1.9
Unknown ¹	15.05	95.0
All other gears	40.47	50.6
Total	711.05	871.2

¹Unknown for 1993 includes oyster dredge.

Table 7-3
Permits issued in the Northeast Region in 1993, by gear type.

Proposed gear use	No. of vessels	No. of boats
Bottom, mid-water, and other trawls	2,157	156
Dredges	1,474	187
Gill/entanglement nets	625	225
Handlines	1,971	1,531
Rod and reel	3,800	2,918
Longlines, set lines	955	241
Other gear	2,623	858
Total permits	13,605	6,116

Alternatively, the Bureau of Economic Analysis² estimates total employment in the harvesting sector of all Northeast fisheries at 15,300 (1992).

Northeast Fisheries Management

Since the passage of the Magnuson Fisheries Conservation and Management Act (MFCMA) in 1976, most commercially important species caught in the Northeast Region's EEZ have come under fishery management plans (FMP's) or preliminary plans promulgated by either the New England or Mid-Atlantic Fishery Management Councils (NEFMC or MAFMC). Table 7-4 lists all Northeast FMP's, the gear regulated, and the type of management.

FMP's are in effect in the Northeast Region for multispecies groundfish (consisting of 13 demersal species), summer flounder, sea scallops, surf clams and ocean quahogs, offshore lobster, and squid, mackerel, and butterfish. There is also an FMP for Atlantic salmon, but no fishing is currently allowed for the species. Various management strategies in effect within these FMP's include traditional indirect methods such as mesh size limits, time area closures and effort restrictions in the form of time limits or days at sea. The current decline in stocks of traditionally harvested species is testimony to the effectiveness of these types of management measures. In some fisheries, ITQ's, quotas, and limited entry plans are in effect. Many fishermen are affected by restrictions under multiple plans.

Various regulatory schemes have been implemented to manage Northeast groundfish stocks. In 1993, the NEFMC approved Amendment 5 to the Northeast Multispecies Fishery Management Plan to restrict days at sea for vessels over 45 feet, in order to reduce fishing mortality by 50% over the next 5-7 years (10 years for haddock). Amendment 5 also imposes a vessel moratorium on most new entrants; mesh size increases; minimum fish sizes; seasonal and area closures (of haddock spawning grounds); vessel, dealer, and operator permits; and mandatory reporting. Pair trawling for groundfish was banned. Also, sink gillnetters must remove nets from the water at specified times and areas to reduce bycatch mortality of harbor porpoises. Longliners fishing

²Unpubl. data (1992) compiled for the NOAA Office of Sustainable Development.

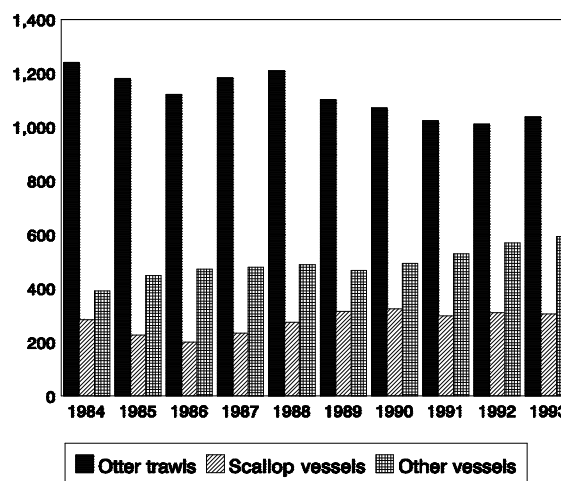


Figure 7-5

Number of otter trawls, scallop dredges, and other vessels operating in the Northeast.

4,500 hooks or less were exempted. A lawsuit brought against the Federal government by a New England environmental group eventually led to the development and passage of Amendment 5.

Since Amendment 5 was quickly found inadequate to restore groundfish stocks, a temporary closure of four areas under an emergency action was imposed by the Department of Commerce in December 1994. The NEFMC's long-term plan for restoring the groundfish stocks, Amendment 7, is expected to take effect in 1996; further reductions in days at sea, area closures, and the establishment of a quota for the remaining groundfish stocks outside of the closure areas are currently under consideration. One of the major concerns will remain the ramifications of closed areas and the subsequent shift in effort by the displaced vessels.

The MAFMC amended its summer flounder (fluke) plan in conjunction with ASMFC as a result of the 1989-90 crash in landings. New rules of Amendment 5 include a 12.35 million pound quota divided among the Northeast states (based on 10 years of historical landings), an increase in mesh size, and a mandatory reporting program. There is a requirement for the use of turtle excluder devices (TED's) south of Oregon Inlet, N.C., to prevent the incidental capture of sea turtles in the bottom trawl flounder fishery. Amendment 7 would revise the fishing mortality rate reduction schedule for summer flounder.

Table 7-4
Commercially exploited species in the
Northeast EEZ managed by NEFMC or MAFMC.

FMP	Gear	Entry control	Management
NE multispecies: Cod, haddock, yellowtail flounder, pollock, winter flounder, witch flounder, windowpane flounder, American plaice, redfish, white hake, red hake, whiting, ocean pout	Directed and mixed trawl	Control date 2/21/91, moratorium	DAS, mesh size, fish size, area closures NR ¹
Summer flounder	Directed and mixed trawl	Control date 1/26/90, moratorium	Quota, mesh size, fish size
Sea scallops	Scallop dredge, otter trawl	Control date 3/1/90, moratorium	DAS, gear restrictions, catch limits on non-DAS effort
Ocean quahog and surf clam	Clam dredge	Moratorium	ITQ
American lobster	Traps	Control date 3/25/91	Size limit
Squid	Small mesh trawl	Control date 8/93	Quota (not limiting)
Butterfish	Small mesh trawl	Control date 8/93	Quota (not limiting)
Atlantic mackerel	Directed and mixed trawl	Control date depends on TAC	TAC (not limiting)
Scup	Directed and mixed trawl, small mesh trawl pots	Control date 1/26/90, moratorium	Quota, fish size NR
Atlantic herring	Purse seine, mid- water trawl, weirs	None	3 area TAC, spawning area closure
Goosefish	Scallop dredge, directed and mixed trawl, gillnet	Control date 2/27/95	NR
Tilefish	Longline, mixed trawl	Control date 6/93	NR
Black sea bass	Pots, mixed trawl	Control date 1/26/90, moratorium	NR
Bluefish	Gillnet, otter trawl, pound net	None	Annual quota NR

¹NR=New or revised plan in development.

The East Coast Sea Scallop Plan (known as Amendment 4), administered by the NEFMC, replaced the meat-count standard with limits on days at sea, gear restrictions, a moratorium, crew size limits, and mandatory reporting. Also, all full-time, part-time, and occasional scallopers are required to participate in a vessel call-in program. Operators, vessels, and dealers must have permits. Days at sea were allocated based on historical participation and classification as full-time, part-time, or occasional scallopers. Although it is under discussion, there are no extant plans to allow for consolidation of the days at sea allocation.

The first individual transferable quota (ITQ) system in a Federally regulated fishery was for off-shore surf clams and ocean quahogs. Amendment 8, in effect since September 1990, provided for the allocation of initial ITQ shares that can be traded or leased to any entity. Under the ITQ system, effort limitations and minimum size regulations have been eliminated. Logbooks containing performance variables are required for the surf clam and ocean quahog offshore fleet. For a discussion of the effect of ITQ management on the performance of the surf clam and ocean quahog fishery, see this region's spotlight article.

Amendment 5 of the American Lobster Fishery Management Plan by the NEFMC provides for a 5-year moratorium on entry into the fishery, the establishment of four different lobster management areas, and a mechanism through which yet undefined lobster regulations will be implemented for each area. Instead of a gauge increase, Amendment 5 aims to reduce fishing effort by various effort control measures, area and season closures, improved data collection, trap limits, and operator permits. The particular effort-control restrictions are being developed during the initial year of the plan by regional Effort Management Teams (EMT).

Another Federal FMP, for squid, Atlantic mackerel, and butterfish, Amendment 4, has existed since 1992. Each year, the MAFMC recommends a quota for each species, and recommends whether the provision for a TALFF should be filled, decisions that can later be adopted by the Secretary of Commerce.

In the Northeast Region, fishing in inland waters and near shore (<3 miles) is monitored and regulated by the individual states in New England, the Mid-Atlantic, and the Chesapeake area. Certain near-shore and inshore fisheries come under the jurisdiction of interstate bodies such as the Atlantic States Marine Fisheries Commission (ASMFC), which performs the coordinating function for species whose range in the territorial sea spans several states.

Major Economic Issues in the Northeast Region

The most obvious issue to many fishermen in the Northeast at the present time concerns the stringent restrictions placed on their fishing behavior by the current closed areas and the anticipated restrictions under the upcoming

Amendment 7 to the groundfish plan as well as Amendment 4 to the scallop plan. Both fisheries have imposed a moratorium on new entrants and severely restricted the days at sea that a vessel may fish and where it can fish. These types of management tools have historically encouraged fishermen to increase their vessel capacity by the altering of other inputs.

Several issues are important from an economic standpoint, due to the groundfish crisis. One concerns the effect of the displacement of fishing effort from current and future closed areas. Another issue is the potential that a vessel retirement/buy-back program may have toward reducing the excess capacity existing in the Northeast and helping to speed resource recovery and keep exploitation rational after implementation. To be most effective, a buy-out program must be designed carefully to ensure efficient and equitable decisions under a variety of fisheries in the Northeast.

A current source of aid to the fishermen in the Northeast has come from the Northeast Fisheries Assistance Program (NFAP), consisting of a \$30 million emergency aid package. The aid is being used to fund revolving loan funds and to encourage aquaculture operations, the harvest of underutilized species, and new business opportunities. Fishing Family Assistance Centers have also been set up in the Northeast to give advice to those who are dependent on the fishing industry for their livelihood.

Effort controls imposed by FMP's, such as restrictions on gear, time limits, area closures, etc., are intended to maintain or rebuild stocks, but they also reduce the productivity of any fishing enterprise and therefore increase the unit-cost of harvesting fish. Estimates of the costs of efficiency-reducing (or stock rebuilding) regulations in the Northeast are not yet available.

The NEFMC has attempted to reduce significantly the take of harbor porpoises through an adjustment to Amendment 5 of the Multispecies Plan. This effort will most likely continue under Amendment 7. This issue arose due to a conflict of interest between gillnet fishermen and groups who value marine mammals over the harbor porpoise bycatch. Much work remains to be done, including evaluation of the porpoise population size and economic ("existence") value of harbor porpoises. The future management of groundfish will likely be affected by the relative costs and bene-

fits of protecting harbor porpoise.

The use of underutilized species (mackerel, herring, dogfish) has received greater attention as concern rises over the levels of traditional groundfish stocks and fishermen's ability to harvest them. Implicit in the discussion of underutilized species is the necessity for market development (domestic and export), whether it be by fishermen or subsidized by the government. The degree of success of product research and market development may be limited, since these species are traditionally low value and in adequate supply around the world.

Another issue of economic importance to the Northeast Region concerns the transboundary stock management by the U.S. and Canada. Since the dramatic closures imposed by the Canadian government to save Newfoundland's and Nova Scotia's cod stocks, major shifts have occurred in the structure of production and trade in fish products. Clearly, a low supply of marketable fish affects the harvesting, processing, and trade sectors. A cutback in the supply of Canadian groundfish may affect New England ex-vessel price (depending on the availability of other international substitutes), increase demand for traditional New England species, and have impacts on the level of trade with Canada and other countries. An opportunity exists for increased cooperation between the United States and Canada on stock management and data sharing that could influence the effectiveness of the management plans along the border.

THE SEAFOOD PROCESSING SECTOR

Changes in the Northeast fishing industry over the last 10 years have altered the makeup of the processing and wholesaling sector. Domestic landings of groundfish and scallops have declined since the early 1980's (Georgianna et al.³), causing firms that either process or wholesale groundfish or scallops to meet a relatively stable demand with increased use of imports. Since 1988, groundfish imports from Canada (25.5% of all 1993 imports came from Canada [NMFS, 1995]) have steadily declined (Georgianna et al.³) often making it difficult to obtain fresh supply. Other regulatory changes, such as the 1986 duty

³Georgianna, D., J. Dirlam, and R. Townsend. 1993. The groundfish and scallop processing sectors in New England. Final Rep., U.S. Dep. Commer. Contr 50EANF-2-00065.

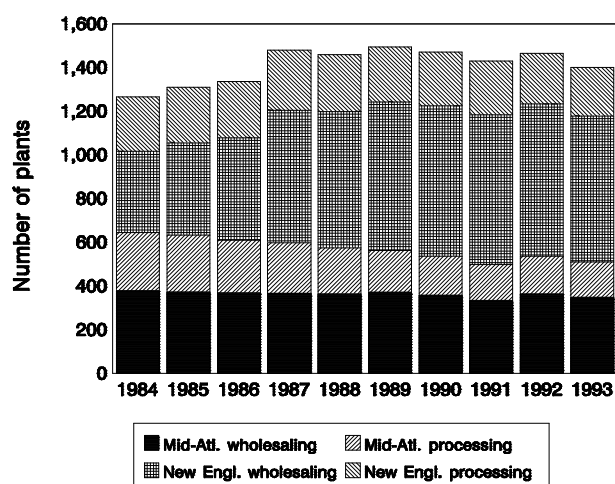


Figure 7-6
Processing and wholesaling plants in the Northeast.

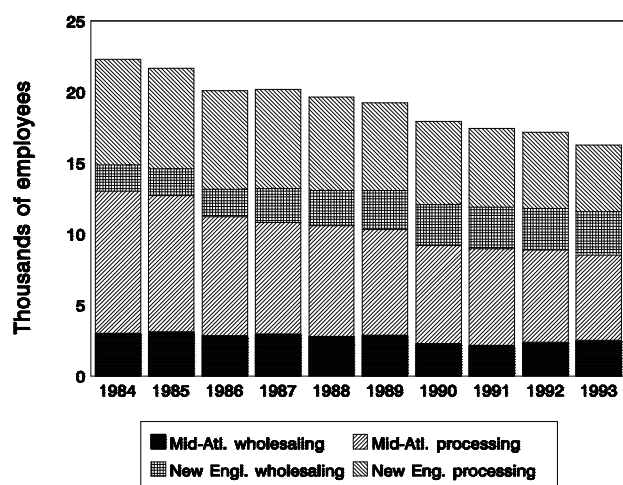


Figure 7-7
Year-round employees in processing and wholesaling in the Northeast.

on whole fish from Canada (Georgianna et al.³), have also affected the way processors do business.

As a result of changes in both the condition of fishery resources and the business environment, the mix of processing and wholesaling plants in the Northeast has been altered. Figure 7-6 shows the number of processing and wholesaling plants in the Mid-Atlantic and New England regions. Since 1983, the number of processing plants in New England has remained steady at about 250. The number of wholesaling plants in New England, however, increased 113%, from 314 in 1983 to 670 in 1993. The number of Mid-Atlantic processing plants decreased by 41%, from 274 to 161, while wholesaling plants decreased 10%, from 387 to 348 over the same period.

Changes are also reflected in the number of year-round (as opposed to seasonal) employees in these sectors, as shown in Figure 7-7. Although the number of New England processing plants remained steady, the number of employees decreased 37%, from a high of 7,470 in 1984 to 4,743 in 1993. Employment among New England wholesalers increased 80%, from 1,690 in 1983 to 3,049 in 1993. Mid-Atlantic processing plants decreased their employment 44%, from a high of 10,015 in 1984 to 5,635 in 1993. Mid-Atlantic wholesaling employment decreased 10%, from 3,203 in 1983 to 2,882 in 1993 (NMFS, 1995).

Product Forms

Fish and shellfish are transformed into various products such as filleted, cooked, breaded, batter coated, canned, cured, or industrial products. The most significant product form (by value) in the Northeast is fresh or frozen fish—cooked, breaded, or batter coated (Fig. 7-8). Of the total fresh or frozen fish fillets, steaks, or portions processed in the Northeast in 1993, New England produced 92%. The Mid-Atlantic region produced 73% of the canned product and 91% of the cured product.

Almost all groundfish landed in the United States and those imported fresh and whole are processed into fresh fillets (Georgianna et al.³). Since the NMFS Processed Products Annual Survey does not distinguish between fresh and frozen product, the relative amounts of each are not reported. There is concern that frozen product is sometimes sold as fresh but little evidence of this has been found in New England (Georgianna et al.³).

Three percent of Northeast processed product is used for industrial purposes. Fish and shellfish meal, fish oil, and fish solubles are used in end products such as animal food, fertilizer, and lubricants. A major portion of the industrial products produced in the Northeast come from the menhaden fishery.

Quantity and Value of Northeast Processed Product

The following figures describe the changes in quantity and value of fish and shellfish processed (those landed domestically, transported from other regions, and imported from other countries) in the Northeast since 1983. Data are not available on wholesale sector activities. Figure 7-9 shows total pounds processed since 1983, and Figure 7-10 shows real value.

Groundfish processing reached a peak in volume and value in 1986 (Table 7-5 lists the species contained in each species group). Both volume and value then declined over the next 3 years by 52% and 30%, respectively. The year 1990 saw a

Table 7-5
Species groups used in Northeast regional report.

Species group	Species
Groundfish ¹	Cod, cusk, flounder (all kinds), haddock, ocean perch (redfish), ocean pout, pollock, whiting (silver hake), tilefish, Atlantic wolffish (catfish), scup (porgy), red hake, white hake, sea basses, goosefish (anglerfish or monkfish)
Other finfish	Alewives, anchovies, halibut, bluefish, bonito, buffalofishes, white perch, butterfish, carp, catfish, bullheads, chubs, croaker, dolphinfish, eels, groupers, sea catfish, herring, lumpfish, mackerel, marlin, mullets, pompano, rainbow trout, rockfishes, sablefish, salmon, swordfish, tautog, tilapias, sea trout, shad, sharks (mostly dogfish), skates, snapper, Spanish mackerel, steelhead trout, striped bass, sturgeons, sunfishes, whitefish, turbot, other
Mollusks	Clams, mussels, scallops, oysters
Crustaceans	Crab, lobster, shrimp
Other nonfinfish	Snails (conches), squids, sea urchins, turtles, seaweed (Irish moss and kelp w/herring), marine shells, other shellfish

¹This grouping is based on the biological definition of groundfish and not just the groundfish listed under the Northeast Multispecies Plan. Refer to text footnote 6 for those species.

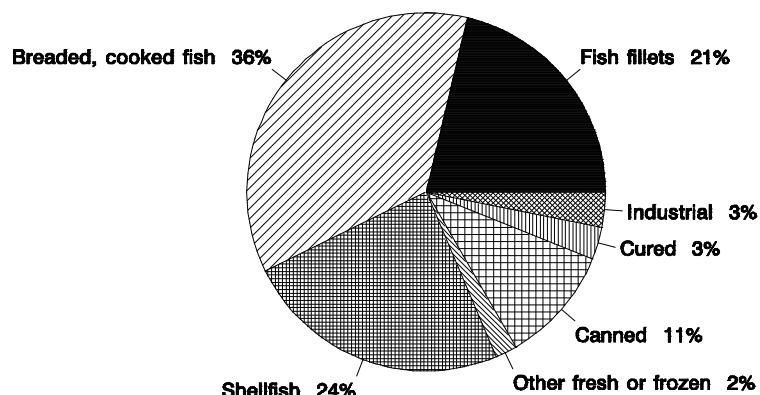


Figure 7-8

Northeast processed products' share of value, by product form. Data from the NMFS (1987) was used because more recent data was not available.

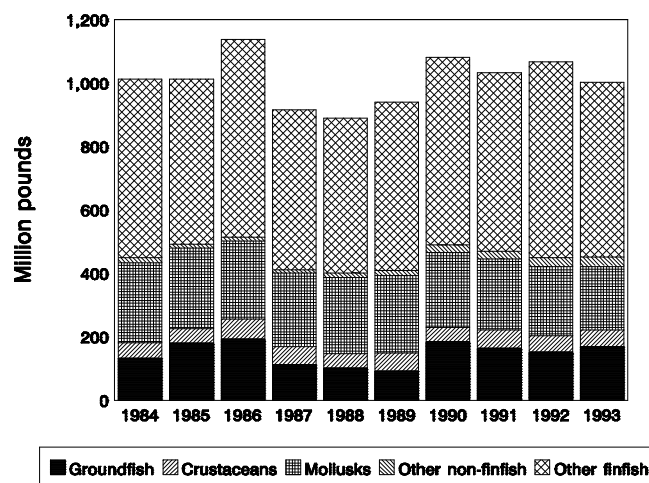


Figure 7-9

Total pounds processed in the Northeast.

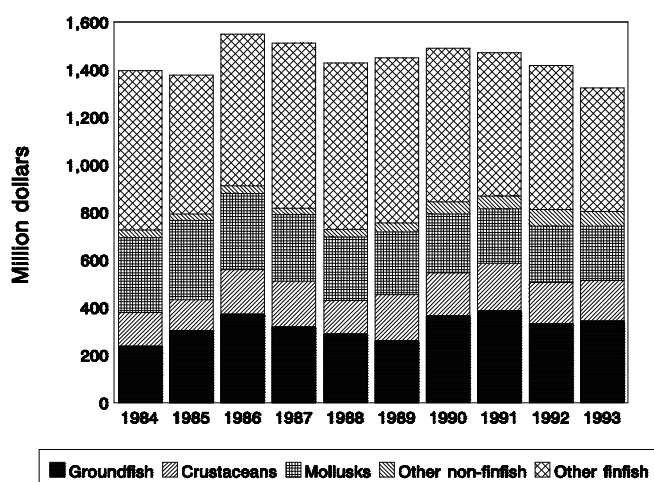


Figure 7-10
Real value of processed product in the Northeast.

near doubling in volume and a 40% increase in value. Processing of other finfish has remained fairly steady since 1983. The lowest production year was 1988 but it appears that an increase in prices from 1985 to 1988 actually increased revenue even though production was declining.

Mollusk processing, dominated by clams, has been steadily declining since the early 1980's. Value has declined steadily since 1985 while quantity has declined steadily since a high in 1984, except for upturns in 1988 and 1989. Although scallop harvesting is a significant activity in the Northeast, scallop processing is less significant since most scallops are shucked at sea and sold to dealers in 40-pound bags. Typically, they are then repacked and wholesaled to restaurants (Georgianna et al.³). Since these activities are not considered processing, they do not get reported in the NMFS Annual Survey of Processors.

Crab and shrimp processing dominate the Northeast crustacean processing activities. Lobsters constitute a relatively minor portion because, similar to scallops, the majority are wholesaled. Other nonfinfish processing has increased substantially (150% in amount and 126% in value) since 1987, due primarily to the increase in demand for sea urchins. In 1987, 141,000 pounds of sea urchins were processed, and in 1992 the figure rose to 3.8 million pounds (2,575%). Value increased from \$238,000 to \$11,635,000 (4,789%) during the same period. Production then dropped to 1.9 million pounds, while value increased to

\$12,085,000 in 1993. The reason for the 1993 decline in volume processed is that, although landings of sea urchins increased from 26.9 million pounds in 1992 to 41.1 million pounds in 1993, processors switched from exporting whole sea urchins to exporting only the roe, which weighs less.

Impacts of Fluctuations in Supply

The challenge for processors supplying the fish market is to balance demand with the ever changing fluctuations in supply. Restaurants and retailers demand consistent quality, quantity, and prices from processors. This is especially difficult when the resources on which processors depend are declining or when management affects the flow of product over time.

Fluctuations in quantity come from seasonality of certain fisheries, declining stocks, and changes in import sources. For example, domestic groundfish stocks have steadily declined, forcing processors to look to Canadian and Pacific stocks. However, Canadian stocks have not fared any better than U.S. Northeast stocks, forcing processors to look even farther from home for species such as cod, haddock, and flounders. Scallops are also being imported from Canada and other countries as substitutes for U.S. scallops (Sutinen et al.⁴). In response to dwindling supplies of more traditional species, processors are focusing efforts on other species such as orange roughy from Australia, New Zealand, and the Far East, and farmed fish such as tilapia, mahi mahi, catfish, and salmon (Georgianna et al.³). Both harvesters and processors have been trying for decades to promote underutilized species such as mackerel, skate, and dogfish.

Amendment 5 to the Northeast Multispecies Fishery Management Plan will have significant impacts on the processing sector. In a bioeconomic analysis of the amendment, completed by the Groundfish Plan Development Team⁵ of the New England Fishery Management Council, landings and gross revenue (to the harvest sector) projec-

⁴Sutinen, J. G., P. Mace, J. Kirkley, W. DuPaul, and S. Edwards. 1992. Consideration of the potential use of individual transferable quotas in the Atlantic sea scallop fishery, volume 5. Rep. prep. under NOAA Contr. 40AANF101946, 40AANF100542, 40AANF201227.

⁵Groundfish Plan Development Team. 1993. Bioeconomic evaluations of the impacts of Amendment #5 alternatives. Rep. to New Engl. Fish. Manage. Council Meet., 13-14 Jan. 1993.

tions of the ten species⁶ covered by the amendment were estimated (Fig. 7-11). Landings are expected to decline by about 10% during the first 5 years of the plan and then rebound above current levels. With a lower level of landings, processors will find it harder to find domestic supplies of traditional groundfish species for the fresh fish market. Since ex-vessel prices are expected to rise as landings fall, the cost to processors will rise. However, when landings rebound in year six, ex-vessel prices will likely fall, easing the burden on processors.

Historically, processors turned to imports as domestic stocks declined. With groundfish, this is becoming more difficult because Canada, a major supplier of the fresh fish market, has completely closed some of its major fishing grounds. Because of the distances involved, importing fresh fish from other areas of the world is not always feasible. Most processors and wholesalers will not substitute frozen fish for fresh fish because of quality problems.

The next several years will be a period of great economic uncertainty for groundfish processors. Many firms will exit the industry because they cannot obtain adequate supplies at a reasonable price. The remaining firms will probably emerge financially stronger and better able to withstand future fluctuations in supply. For firms to survive the likely future fluctuations, they will need to diversify and be able to market a greater variety of products than just traditional groundfish.

THE TRADE SECTOR

The Northeast Region typically runs a trade deficit (more seafood is imported than exported) in edible fishery products because of a large port-of-entry in New York, the proximity to Canadian fishing grounds, and the magnitude of Canadian imports. Figure 7-12 shows both the value of imports to and exports from the Northeast Region during 1983-93. Imports peaked in value during 1987 and have been declining ever since, while the value of exports peaked in 1991 and has declined the last 2 years.

A trade deficit in fishery products is not a "bad" thing to have. Processors located in the re-

⁶Atlantic cod, haddock, pollock, redfish, American plaice, witch flounder, yellowtail flounder, winter flounder, window-pane flounder, and white hake.

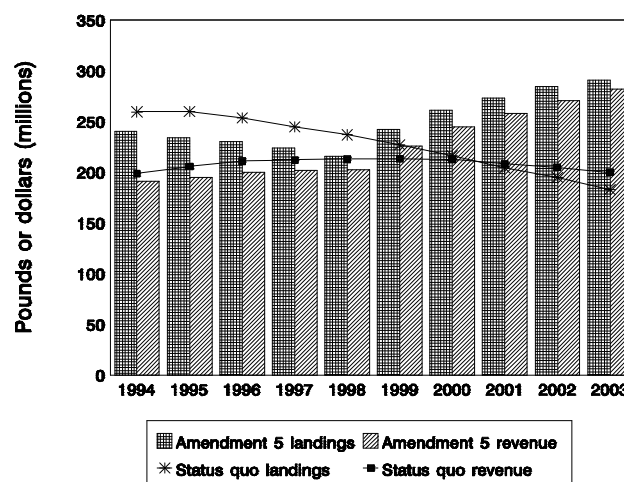


Figure 7-11
Projected Northeast groundfish landings under Amendment 5.

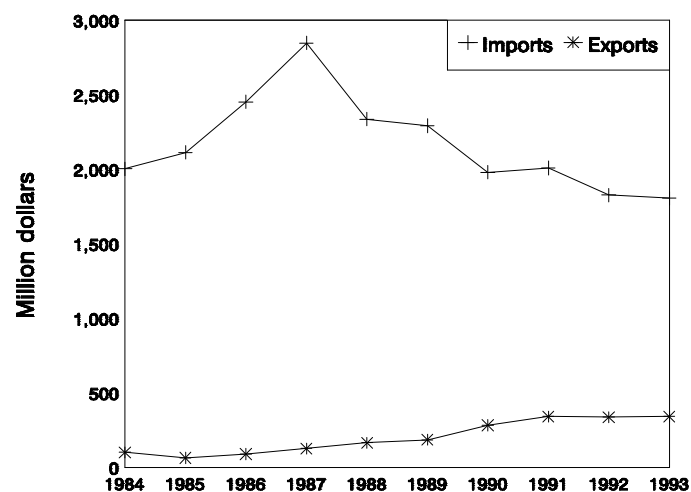


Figure 7-12
Northeast Region trade in edible fishery products.

gion have access to product from foreign countries when local supply is not available or is not sufficient to meet demand. Consumers are able to purchase a wide variety of products throughout the year at lower prices. Additionally, it has been estimated that as much as 70% of the edible fish that is imported into the Northeast Region is eventually shipped to other parts of the country (NEFC, 1991). This can generate jobs and income

in the region in the processing sector and the transportation industry that moves products from the port-of-entry or processing plants to their final destinations.

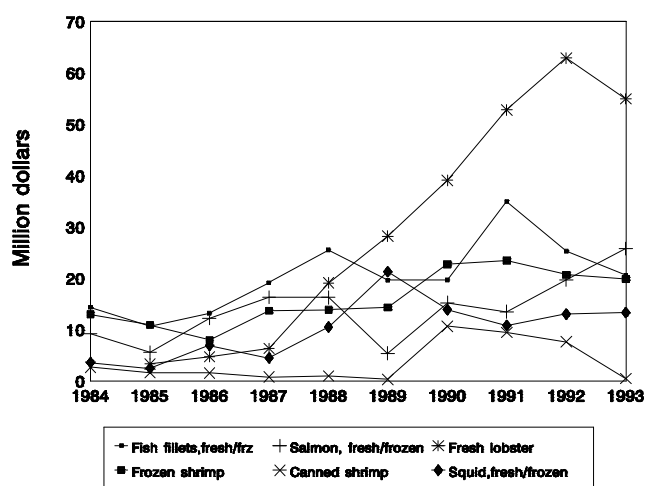


Figure 7-13

Northeast Region value of selected fishery products exports.

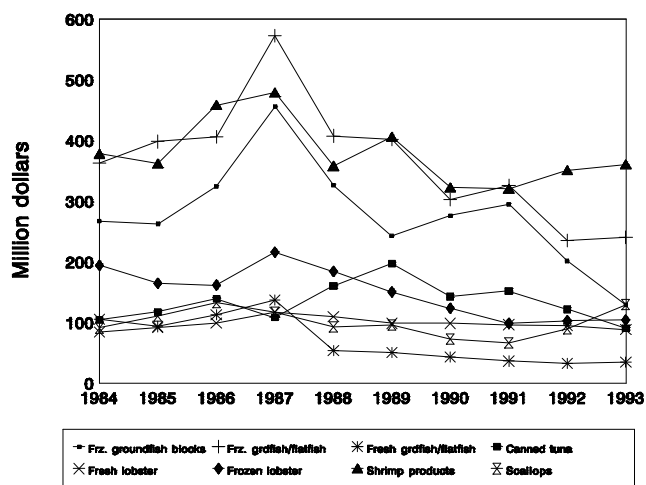


Figure 7-14

Northeast Region value of selected fishery products imports.

Significant Exported and Imported Seafood Products

The five most valuable products exported from the Northeast Region during 1993 were fresh lobsters (\$68.2 million), sea urchin roe (\$43.8 million), fresh or frozen salmon (\$32 million), fresh or frozen fish fillets (\$25.6 million), and fresh or frozen squid (\$16.5 million). Sea urchin roe has increased 344% in export value since 1991 (\$12.75 million) because of strong demand in the Japanese market. Lobster exports have increased in both value and volume almost 1,700% since 1985.

The five most valuable product groups imported into the Northeast Region during 1993 were: shrimp products (\$447.6 million), frozen groundfish and flatfish fillets (\$297.8 million), frozen groundfish blocks (\$160.4 million), scallops (\$160.3 million), and frozen lobster (\$128.6 million). Declines in imports of frozen groundfish blocks (54% from 1991 levels of \$347.9 million) are due to the decline in imports from Canada. Canada, which has traditionally been the biggest supplier of fishery products, closed many of its Atlantic fishing grounds because of sharp declines in groundfish resources.

Important Trends in Northeast Trade

Because of the variety of different products exported from the Northeast Region and the change that took place in the Harmonized Tariff Schedule of the U.S.A. (HTSUSA) codes beginning in 1989, six product categories were chosen to examine trends in exports during 1983-93. Product categories include: fresh or frozen fish fillets, fresh or frozen salmon, fresh lobster, frozen shrimp, canned shrimp, and fresh or frozen squid. Trends in the values for all six product categories can be seen in Figure 7-13.

Between 1984 and 1993, the volume of salmon exports rose 350%, much of which can be attributed to cultured salmon. During the same period, real value rose 261%, which is less than the increase in volume and indicates declining real export prices.

Figure 7-14 shows the value of eight product categories imported from 1984 to 1993. Product categories are frozen groundfish blocks, frozen groundfish and flatfish fillets, fresh groundfish and flatfish fillets, canned tuna, fresh lobster, frozen lobster, shrimp products, and scallops.

Derived Demand for U.S. Species

Foreign demand for U.S. fishery products generally benefits U.S. fishermen and processors. However, there can be unintended consequences from such trade when access to the resource is unlimited. One current example is the strong demand in Japan for roe of the sea urchin, which has traditionally been thought of as a “trash” species by U.S. harvesters. Sea urchin roe is now the second most valuable export from the Northeast Region and has increased in value 344% since 1991. Exporting processed sea urchin roe rather than live sea urchin benefits U.S. processors because the product has a higher value. Labor employed by U.S. processors benefit from jobs and income. Fishermen are also able to fish for sea urchins after their traditional fishing season ends, with very little conversion costs. Most sea urchins are harvested by divers in coastal Maine working from commercial fishing vessels between September and March. This period coincides with the end of lobster and gillnet fishing and provides alternative activities for vessels to engage in until the next fishing season.

Although these exports have undoubtedly benefited Northeast fishermen and processors, it is uncertain how long the resource can be extracted at the current rate. The sea urchin fisheries in California, Oregon, and British Columbia all displayed signs of overfishing after short periods of heavy exploitation (Creaser⁷). Between 1987 and 1993, landings in the Maine sea urchin fishery increased from 1.4 to 40.3 million pounds and from \$0.26 million to roughly \$26.1 million in value. Between 1992 and 1993, the number of licenses to harvest sea urchins by hand in Maine increased almost 80%, and the number of boat licenses more than doubled (Creaser⁷). Along with the possibility of resource depletion, there is a strong likelihood that the region’s resource rents from sea urchins are being dissipated in excess labor and diving gear and in processing capacity. Although increased export of U.S. processed products is a desirable goal, it is unlikely that this rate of harvest is sustainable.

⁷Creaser, E. P. 1994. Sea urchin catch/effort data. Proposal submitted to Natl. Mar. Fish. Serv. by Maine Dep. Mar. Resour., Augusta.

THE RECREATIONAL HARVESTING SECTOR

Marine angling is one of the most popular outdoor recreational activities in America (USDI, 1991). In 1991, 9.5% of the population of the New England coastal states and 5.9% of the population of the Mid-Atlantic coastal states participated in marine recreational fishing within their own state (NMFS, 1991; Bureau of Census, 1992). These anglers create a demand for a wide variety of goods and support services. Businesses that supply these goods and services are collectively referred to as the marine recreational fishing industry. This industry employs thousands of Americans, and accounts for sizeable capital expenditures.

Summary Statistics

The total number of finfish caught in the Northeast Region by anglers has generally declined over the past 10 years (Figure 7-15). Following the peak annual catch of the decade in 1986 (203.8 million), successive declines occurred and reached a 10-year low in 1989 (89.2 million). Since then catches have climbed slightly to 101.6 million fish in 1993, a 12.4 million increase over 1989.

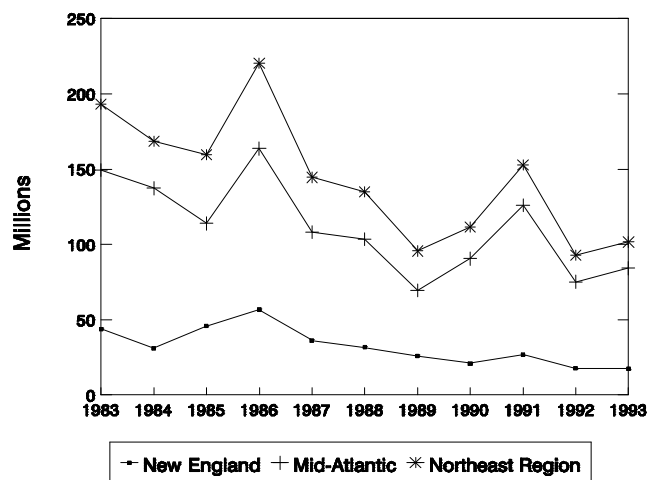


Figure 7-15
Estimated number of fish caught by recreational fishermen in the Northeast, by subregion.

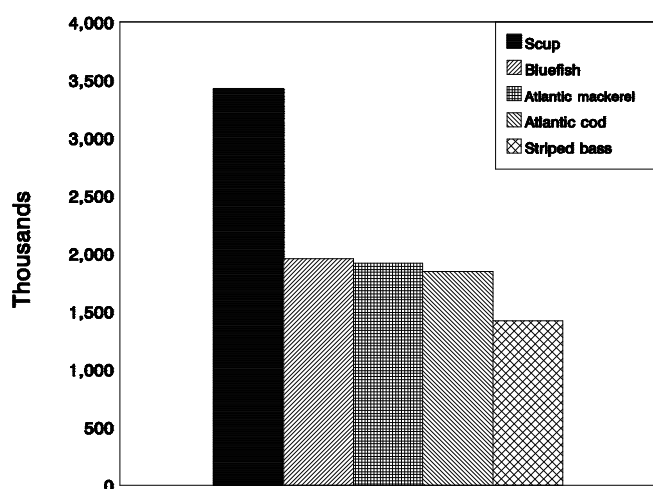


Figure 7-16

Top five species caught by recreational fishermen in New England in 1993.

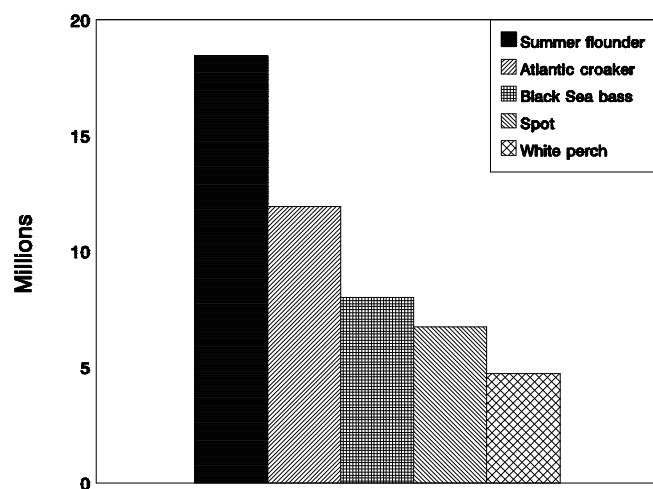


Figure 7-17

Top five species caught by recreational fishermen in the Mid-Atlantic in 1993.

Scup, bluefish, Atlantic mackerel, Atlantic cod, and striped bass were the most commonly caught species (in that order) in New England in 1993 (Fig. 7-16), comprising roughly 61% of the total catch in number. Summer flounder, Atlantic croaker, black sea bass, spot, and white perch were the most commonly caught species in the Mid-Atlantic in 1993 (Fig. 7-17), comprising roughly 59% of the total catch in number.

The annual number of fishing trips taken (effort) in New England and the Mid-Atlantic decreased roughly 4.5% during the past decade. In New England effort fell about 5%. An estimated 18.7 million fishing trips were taken in 1993, down from 32.4 million in 1983 (Fig. 7-18). Anglers in the Mid-Atlantic account for about twice as many trips as their counterparts in New England. This is partially attributed to the longer fishing season in the Mid-Atlantic.

Private or rental boats accounted for the highest percentage of the fishing effort over the last decade (Fig. 7-19 and 7-20); these types of fishing trips declined from 15.2 million in 1984 to 9.7 million in 1993. Private/rental boat anglers also accounted for the highest percentage of fishing effort within each subregion. However, in New England, shore anglers outnumbered private/rental boat anglers for the first time during 1991 and again in 1993. Overall, effort declined significantly in all modes, with the party/charter mode accounting for the largest relative decrease during the past 10 years (7.1%).

The number of residents of coastal states who participated in marine recreational fishing in their own state fell roughly 5% over the past 10 years. In 1993, about 2.6 million residents of coastal states in the Northeast Region participated in marine recreational fishing in their own state, a 1.7% increase from the ten-year low level of participation during 1992 (Fig. 7-21).

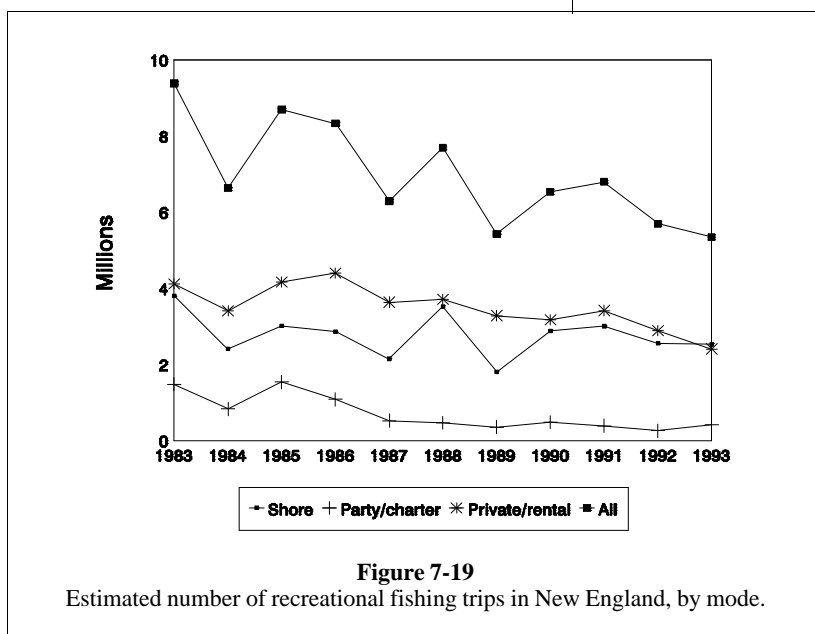
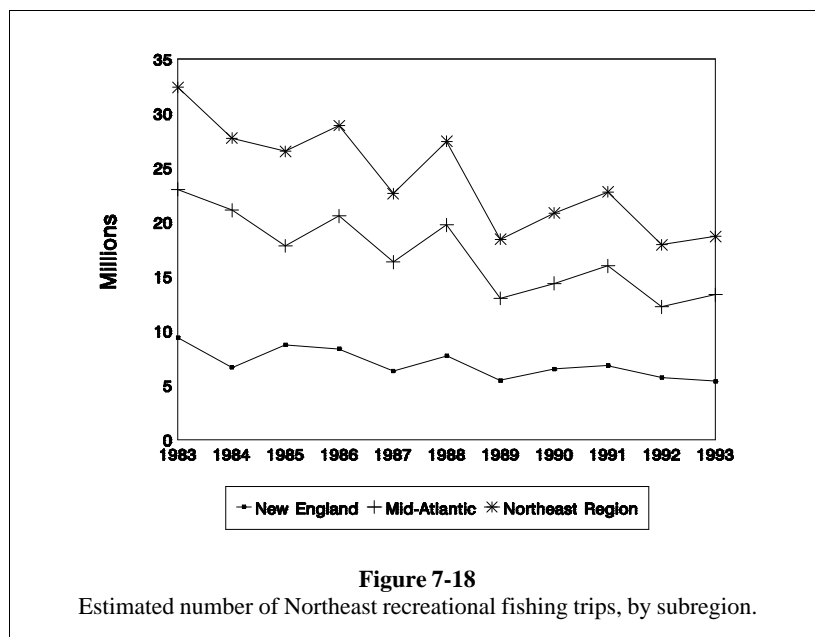
Federal and Northeast State Fishery Management

Upon implementation of the MFCMA, two councils were established to manage the commercial and recreational fisheries within the EEZ of the Northeast Region: the New England Fishery Management Council (NEFMC) and the Mid-Atlantic Fishery Management Council (MAFMC). Individual state governments have regulatory jurisdiction and authority in their terri-

torial seas (from their coastline to 3 miles offshore).

The Atlantic States Marine Fisheries Commission (ASMFC), formed in 1942, was the first interstate commission authorized by Congress to deal with marine fishery conservation (Royce, 1989). Since 1980, through a cooperative agreement with NMFS, the ASMFC has developed numerous interstate coastal fishery management plans. Several plans involve recreational fisheries. Historically, the responsibility for managing the Atlantic coastal fisheries rested primarily with individual state governments (Section 306, MFCMA). Thus, coastal states were not required to implement and enforce the measures of any ASMFC plans. Often, this multijurisdictional arrangement resulted in inconsistent management strategies for marine finfish that migrate across jurisdictional boundaries.

Given the importance of marine fisheries and the need for effective, mutual implementation of fisheries management programs among the states of the Atlantic coast, the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) was signed into law in December 1993. This landmark fisheries legislation directs the ASMFC to adopt fishery management plans for coastal fisheries and establishes an affirmative obligation on the part of states to implement the ASMFC's plans. While ACFCMA regulations shall be superseded by any conflicting Federal regulations in the EEZ (Section 804), the legislation promotes mutual state and Federal development of conservation programs. Most importantly, the legislation authorizes the Secretary of Commerce to declare a moratorium on any state that does not comply with the provisions of an ASMFC management plan (Section 806). States of the Atlantic coast must implement and enforce the measures of fifteen existing coastal fishery management plans developed by the ASMFC or be subject to a moratorium on all fishing for the species in question within the offending state until they come into compliance. In New England, five of the ASMFC fishery management plans involve recreational fisheries: summer flounder, winter flounder, herring, bluefish, and striped bass (managed by the ASMFC under the Atlantic Striped Bass Conservation Act (ASBCA). Furthermore, the Mid-Atlantic states will be required to come into compliance with an additional six ASMFC fishery management plans that involve recreational fisheries (red drum, spotted seatrout, weakfish, spot,



croaker, and Spanish mackerel).

Currently, nine Federal FMP's that affect recreational fisheries in the Northeast Region's EEZ are in place: Atlantic billfishes; Atlantic bluefish; Atlantic coast red drum; Atlantic mackerel, squid, and butterfish; Atlantic salmon; summer flounder; swordfish; sharks; and Atlantic tunas. These FMPs establish various recreational management measures including: possession limits, size limits,

quotas, seasonal and area closures and, in the case of Atlantic salmon and striped bass, a complete moratorium in the EEZ (recreational and commercial). For some mixed recreational-commercial fisheries, such as bluefish and tunas, the total allowable catch has been explicitly allocated between recreational and commercial user groups. To reserve the Atlantic billfish resource for its traditional use, the fishery has been declared unconditionally for recreational use only (FMP for Atlantic billfishes).

Management by Allocation

In the Northeast, the competition between commercial and recreational fishermen for limited stocks of fish has intensified as a direct result of increased demand for seafood, a general decline in the quality of the marine environment, and technological advances in harvesting gear. Consequently, the need for management of mixed recreational-commercial fisheries has grown.

In overexploited fisheries, resource managers have been compelled to allocate fish stocks through various management measures amongst commercial and recreational fisheries in an attempt to reduce harvesting levels over time. Given the financial stakes in having access to a fish stock, allocation of many shared species has become a highly controversial and increasingly adversarial process.

Economics in Northeast Allocation Decisions

While descriptive economics data have certainly been included in all FMP's in the Northeast Region, fishery managers have made only modest attempts to use these data to allocate fish resources. Instead, all of the FMP's either explicitly or implicitly recognize the "traditional use" of the resource and typically allocate based on historical catch shares. Often purely financial information, such as expenditures and revenues, are inappropriately used to give ex post justification to the proposed allocations. For example, one of the objectives of the bluefish FMP is to "Provide the highest availability of bluefish to U.S. fishermen while maintaining, within limits, traditional uses of bluefish—defined as the commercial fishery not exceeding 20% of the total catch" (Section 4.3 Fishery Management Plan for

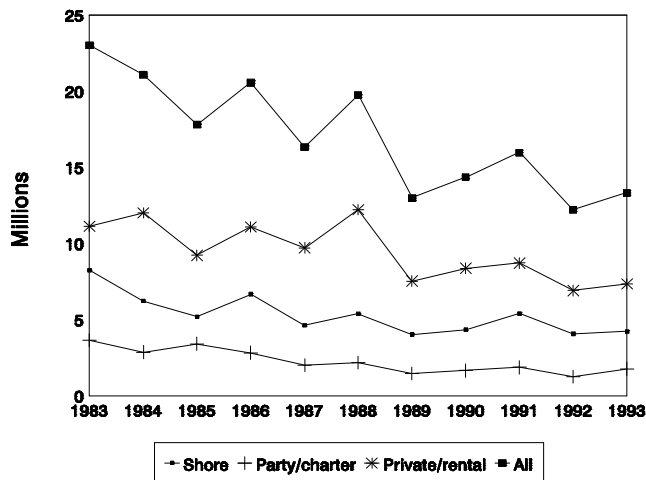


Figure 7-20

Estimated number of recreational fishing trips in the Mid-Atlantic, by mode.

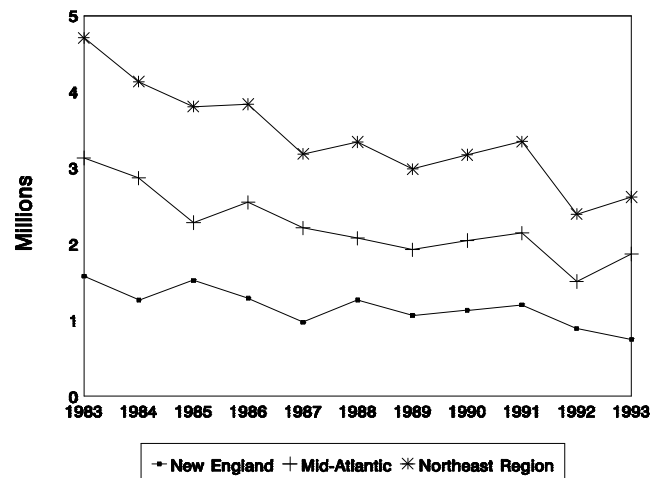


Figure 7-21

Number of in-state recreational fishing participants in the Northeast, by subregion.

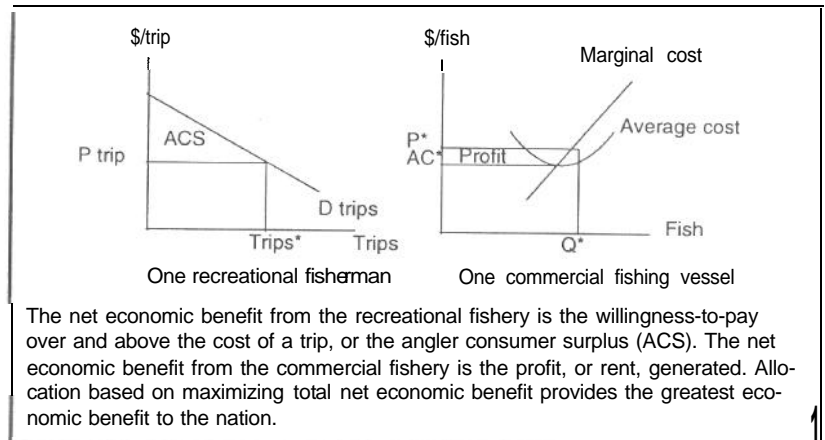
the bluefish fishery).

Clearly, the prescribed allocation between commercial and recreational fishermen is based on historical catch shares alone; the allocation scheme was not driven by economic objectives. Because angler consumer surplus or producer surplus were not estimated, the relatively low level of employment and income attributable to bluefishing activity in the commercial sector relative to the recreational sector was inappropriately used to rationalize the currently maintained 80/20 allocation. Using these measures of economic impact to rationalize allocation decisions, or as a means of making resource allocation decisions, ignores the fact that society is better off when commercial fishermen minimize fishing costs. The ability to project financial effects is important to manufacturers and local and state governments to find out how fishery regulations might affect their share of markets and revenues, including taxes (Edwards, 1990); but this information does not provide a reliable measure of value for making or evaluating alternative resource allocation decisions'.

Economic Data

Although it is clear that a gain in economic efficiency implies a gain of net national benefits, to date economic efficiency has not played an important role in resource allocation decisionmaking in the Northeast Region. Often, analyses are constrained by a lack of appropriate economic data. This is due in part to serious limitations in current guidance and standards on acceptable economic methodologies in the MFCMA that impede the development of consistent economic evaluation approaches.

Currently, two public sector surveys collect information on marine recreational fishing in the Northeast Region: 1) the Marine Recreational Fishery Statistics Survey (MRFSS), and 2) the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (NSFW). The information obtained from these surveys allows resource managers to track trends in catch rates, participation, and expenditures on marine recreational fishing but does not provide the necessary data for economic value assessments. Thus, fish-



ery managers have been forced to rely upon fairly specialized private sector data collection and analysis developed under disparate viewpoints and guidelines to address allocation decisions in an **efficiency** framework. For example, in the Billfish FMP, the regional councils approved a prohibition on commercial sale of billfish by concluding that recreational uses of billfish had greater economic value than commercial uses. The allocation decision was approved despite the fact that no estimates of ex-vessel or retail demand were available for the commercial sector, and the recreational values were derived from only one study of billfish limited to a small portion of the Atlantic Region⁹. While the Councils sought to maximize economic efficiency, the unconditional recreational allocation was difficult to substantiate due to data limitations.

Recently NMFS has expanded efforts to collect marine recreational economic data needed to make rational allocation decisions in the Northeast. A comprehensive economic survey of recreational anglers in the region was designed to help fill the economic data and research gap in our knowledge of marine recreational fishing. The research is motivated by the idea that the economic value of marine recreational fishing will be an essential component in future fishery management issues and a foundation with which future recreational policies can be evaluated is critical.

Objectives of the economic survey were to: 1) collect demographic and economic data on marine recreational fishing participants, and 2) to estimate statistical models of the demand for marine recreational fishing for eight important re-

⁸For more information on the methodology used to describe the links among industries (in terms of employment, expenditures and revenues), consult Edwards (1990); see Storey and Allen (1993) for applied use of economic impact analysis.

⁹New Jersey. See Atlantic Billfishes FMP, Appendix 1.

creational species that are either currently managed or are expected to be managed in the near future. The information will be used to answer questions about the economic value of or costs of two common forms of regulations imposed on anglers: 1) restrictions on participation in or access to fishing, and 2) methods that change anglers' catch (e.g., creel limits, catch and release, minimum size).

LITERATURE CITED

Bureau of Census.

1992. Statistical abstract of the United States 1992. U.S. Dep. Commer., Econ. Stat. Admin. Bur. Census, Wash., D.C.

Edwards, S. F.

1990. An economics guide to allocation of fish stocks between commercial and recreational fisheries. U.S. Dep. Commer., NOAA Tech. Rep. NMFS 94.

NEFC.

1991. Status of the fishery resources off the northeastern United States for 1990. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/NEC-81.

NMFS.

1987. Processed fishery products annual summary, 1987. U.S. Dep. Commer., NOAA, Natl. Mar. Fish. Serv.

1991. Marine recreational fishery statistics survey, Atlantic and Gulf coasts, 1990-1991. U.S. Dep. Commer., NOAA, Natl. Mar. Fish. Serv.

1995. Fisheries of the United States, 1994. U.S. Dep. Commer., NOAA, Natl. Mar. Fish. Serv., Curr. Fish. Stat. 9400.

Royce, W. F.

1989. A history of marine fishery management. Rev. Aquat. Sci. 1:27-44.

USDI.

1991. National survey of fishing, hunting, and wildlife-associated recreation. U.S. Dep. Inter., Fish Wildl. Serv., Wash., D.C.